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THE ENDOCRINES, BY SAMUEL WYLLIS BANDLER, M. D., W. B. Saunders Co., Philadelphia and London, 1920. 486 pp.; price, cloth, $7.00 net.

REVIEWED BY
T. W. GALLOWAY

In the sudden enthusiasm generated by new discoveries that are clearly important, we human beings are reasonably sure to be swept into fads and over-emphasis. Both our generalizations in scientific philosophy and the more practical applications of them to the treatment of human ailments are full of illustrations of the momentum of credulity. The student of the history of science will recognize instances under the terms,—"natural selection," "adaptation," "eugenics," "eye strain," "uric acid." and the like, in which truth has been over-pressed.

It would be a miracle under the circumstances if the thoroughly admitted omnipresence of endocrine secretions in the blood, produced by all sorts of normal and abnormal groups of cells, should not congest human traffic over the same course, and lead the willing student of the subject into statements which are not now established. For example, the present author asserts that they (the endocrines) are the underlying factors in heredity;" and, more specifically, "The differences between animals of various species (and among individuals of the same species) are due to the ductless glands," and more of like tenor. While it may well be true that the hereditary structural elements in the germ cells are influenced by the internal secretions of the soma in which the germ cells lie, and both soma and germ cells are profoundly influenced in their later development by their mutual secretions, such over-sweeping statements of causation are not altogether impressive. It is a bit like saying that the environment is responsible for heredity! which is doubtless true. In spite of this over-enthusiasm, the body of the book contains a mass of most interesting statements supported by many cases,—with history, symptoms and experimental therapy given,—as well as by inference. The author is a gynecologist and naturally stresses the hormones linked most closely with the functions of sex development, reproduction, pregnancy, parturition, and with the emotions connected with these.

The author with commendable boldness even undertakes to redeem some territory from the deluge of Freudian interpretation, by way of endocrine action. He makes a strong case for believing that many of the complexes, hysterias, bad orientations, and phobias which the psychoanalysts accredit to mental conflicts are in reality due to a poor balance in the endocrine system.

Rather unfortunately, because the author does not seem to have a large first-hand knowledge of investigation on inheritance, the book is introduced by a somewhat rambling and inconsequential jumble of illustrations and exhortations which is rather euphemistically labeled "Environment and Heredity,"—presumably because these terms combined make room for about all that can be said on any subject. An analogous looseness and lack of system in arrangement mars the treatment at many points and leads to much unnecessary repetition, and to some seeming conflicts. This is particularly illustrated in comparing chapter 3, The Introduction to the Story of the Endocrines; chapter 4, Internal Secretions, and chapter 18, The Balance between the Endocrines. The total is something like what one might use in a series of lectures on the subject to a class in which inattention or lack of preparation would make much restatement seem necessary, rather than what one expects in a scientific book.

Aside from those mentioned, the following are the principal chapter headings: Environment and Heredity; The Endocrines in Gynecology; Hypergenitalism and Hypogenitalism; Skin Affections and Internal Secretions; Puberty and Climacterium; The "Higher up" Theory of Sterility in Women; Pregnancy, Labor and Placental Gland; Constitutional Dysmenorrhea; Instincts and Emotions; Mental and Nervous Defects; Mental Deficiency and Criminality; Neuroses and Psychoses; Phobias; The Autonomic Nervous System; Therapeutic Suggestions concerning Endocrines; and several chapters dealing with histories, symptoms, clinics and cases.

Possibly an illustration will aid in making vivid the author's repeatedly emphasized point of the interdependence of the internal secretions. In respect to lactation after labor, the following facts are significant:—The mammary glands are developed at puberty by the interaction of secretions from the ripening ovaries, the posterior hypophysis, the thyroid and the adrenals. A secretion from the ovaries or from the endometrium causes them to swell at menstruation. Placental secretions during pregnancy produce hypertrophy and differentiation of tissue at that time, and seem to inhibit the action of the above mentioned secretions. Milk itself will not form however until this placental secretion is removed or inhibited. After birth the ovaries, posterior hypophysis and other endocrines resume sway and stimulate degenerative process by which milk is formed.

Assuming that feminine metabolism and emotional states are more variable and instable than the masculine, the explanation by the endocrinologist would include such facts as these:—men and women alike possess these numerous glands and with all degrees of original potency; all these glands are normally pouring their secretions into the blood constantly; the secretion of each gland modifies those of certain, if not all the other glands, as well as general metabolic conditions thruout the body; the glands, directly or indirectly are also modified in their action by the metabolic conditions and by sudden changes of state (as of the emotions) which may be initiated by the environment; gradually under normal conditions and in average individuals these various forces come into an adjustment that represents a person's constitutional norm; in women 13 times a year there is a cyclical interruption of this balance by the introduction of new factors which influence all the endocrines involved and thus upset the balance; in the case of pregnancy, new secretions (and consequent modification of the endocrine balance and of the mental states dependent upon this) are introduced about each of these points: pregnancy, fetal development, parturition, lactation, and the cessation of lactation.

Probably it will be of most service to the readers of this review, in trying to give an idea of the comprehensiveness of the book, to outline the sources, effects and interrelations of the various internal secretions as the author conceives them, especially the more intimate interrelations between the thymus, thyroid, pituitary and the sex glands. The experiments and deductions pointing to, and partially explaining, the cyclical character of these sex-linked endocrine activities seem to the reviewer the most effective and valuable part of the book. The treatment of the sexual and reproductive secretions of the male is not nearly so adequate, in spite of their greater simplicity, as is that of the female.

TABLE OF ENDOCRINES AND THEIR ACTIONS

(Doubling the signs + and − in column 3 indicates excessive action.)

SOURCE OF THE ENDOCRINE	RELATION TO OTHER GLANDS	Hyper, + or Hypo, −	SYSTEMIC AND GENERAL FUNCTIONAL EFFECTS	REMARKS
HYPOPHYSIS:	Associated with thyroid; sex; adrenals.	−	Influences physical, mental and sex development. Leads to dwarfing; sexual infantilism, etc.	Has two somewhat antagonistic hormones. Broadly antagonistic to ovary.
Anterior Lobe................		+ ++ − +	Rapid growth at puberty. Normal giants; after puberty, acromegaly. Inhibition of bone development; feminine quality in males. Protective to pregnant uterus; stimulates embryo.	Specially *male* in its influence. With testis, adrenal cortex and interstitial thyroid produces male peculiarities.
Posterior Lobe...............	Associated particularly with ovaries, uterus, etc. Associated with thyroid insufficiency.	+ +.− + −− ++	Affects metabolism, especially carbohydrate. Trophic control, especially over uterus and genitals. Contributes to libido. Adiposity. Modifies menstruation and accentuates labor. Before puberty, sexual infantilism and inhibition of menstruation; after puberty genital atrophy. Dysmenorrhea; sex feelings more pronounced; nausea, etc., of pregnancy.	Specially *female* in its influence. Coupled with ovary (follicular), adrenal medulla and glandular thyroid, results in peculiarities of the female.
THYROID........................	Associated with sex, particularly in female. Mutual hypertrophy of thyroid and parathyroid on removal of either. Excites thymus.	+ − −− ++	Influences calcium metabolism, and activates general growth and function. Retards growth; produces sluggishness and laziness. Myxodaema, cretinism. Excitability, irritability, tremor.	Active at puberty; regresses in old age.
PARATHYROIDS	Antagonistic to thyroids.	+ − ++	Influences calcium metabolism; moderates activity of central nerve cells; and increases sensibility of sympathetic system. Uterine or general tetany in pregnancy. Muscular weakness.	Important in pregnancy. Pregnancy increases their activity.
ADRENALS:	Associated with thyroid and hypophysis in sex organs; and development.	+	Antidote for muscular fatigue; protects against toxemia of pregnancy. Aids growth and sex development.	Secretion increased by emotions.
Cortex........................	Enlarged at pregnancy.	++	More masculine qualities, as courage, anger, muscular energy.	Connected with anger.
Medulla		++	Over-stimulation of medulla, nervousness, anxiety, fear, blushing.	Medulla responds especially to *fear.*
THYMUS	Associated with thyroid, parathyroid, pineal, and sex (especially in male). Depressed by ovaries and adrenals.	+ + −	Inhibits development of gonads. Thin, short, fragile bones. Hastens sex and other maturity.	Influences calcium metabolism; regress at puberty, and stops inhibiting effect.
PINEAL.........................	With thymus; antagonistic to hypophysis.	+ −	Inhibits development of sex glands. Physical and mental precocity.	Develops from 1-7th year.

SOURCE OF THE ENDOCRINE	RELATION TO OTHER GLANDS	Hyper, + or Hypo, −	SYSTEMIC AND GENERAL FUNCTIONAL EFFECTS	REMARKS
SEX GLANDS:—				
Ovaries (general)............	Inhibits (slightly) growth and function of anterior lobe of hypophysis.	+	Tends to control height by effect on epiphyses: late ripening (or castration) increases stature; early ripening interrupts.	
" (special)	Stimulates adrenals and anterior hypophysis.	+ − − + − − +	Trophic control of mammary glands. Castration before puberty prevents libido. Responsible for menstruation. May produce original or regressive infantilism. Protects uterus from too great invasion from placenta.	
Interstitial cells;—(Stroma)	Antagonistic to corpus luteum. Stimulates adrenal cortex and anterior hypophysis.	+ + +	Produce, in connection with other secretions, the secondary female characters at puberty. Control cyclical changes in uterine membrane. Related to formation of blood; dimishes the coagulability of blood. Rhexis; menstruation.	
Follicles (ripening and ruptured);—	Influenced greatly by posterior hypophysis, adrenals, and thyroid. Stimulates adrenal medulla.	+	Trophic to uterus, particularly uterine lining.	These increase old or add *new* secretions to ovary (?) Influenced by and influences menstruation.
Corpus luteum (false; of menstruation):..........	Reacts on thyroid and posterior hypophysis.	+	Stimulates thyroid in anticipation of pregnancy; inhibits posterior hypophysis to check uterine contractions.	
Corpus luteum (of pregnancy);—	Stimulates glandular thyroid, and inhibits contractile effect of post. hypophysis on uterus.	+ + + +	Inhibits maturation of follicles and ovulation during pregnancy; and sometimes afterward (?) Stimulates growth of decidual cells of lining, and aids imbedding of fertilized ovum. General nutritional effect on uterus in early pregnancy. Protects wall of uterus from too great invasion by trophoblast cells.	Is stimulated by placental secretion of embryo.
Uterine decidua (endometrium)	Mutual stimulation of endometrium and ovary, involving the ovulation-menstruation cycle.	+ −	Sensitizes the ovary. Atrophy of uterus, through inhibition of activity of ovary (follicles).	
Mammary Glands (Nursing)	Hormone antagonizes ovarian activity.	+ ++	Contracts uterus; inhibits menstruation. Atrophy of uterus, and inhibition of ovulation.	Especially where underfunctioning of hypophysis.
Testes:— Interstitial cells. (Other products?)	Operates on, and with, anterior hypophysis, adrenal cortex, pineal, and thyroid.	+ −	To produce general male characteristics of body and mind: heavier and longer bones, shape, hair, changes in pharynx, impulses, etc. Derangement of associated glands, and inhibits sexual growth and differentiation.	Maybe overcome by ovarian extract and thyroid.

SOURCE OF THE ENDOCRINE	RELATION TO OTHER GLANDS	Hyper, + or Hypo,	SYSTEMIC AND GENERAL FUNCTIONAL EFFECTS	REMARKS
FETAL (Embryonic):—				
Fertilized egg and Trophoblast:	Inhibits joint work of interstitial secretion and posterior hypophysis.	+	Gives off elements which inhibit menstruation, by checking rupture of blood vessels and escape of corpuscles, even during congestion.	Settles in endometrium, and develops attachments therein.
	Cooperates with corpus luteum.	+	Inhibits normal regression of corpus luteum; i. e., stimulates its growth and activity.	
and Later placenta:	Increases the growth (permanently) and function of anterior hypophysis.	+	Stimulates growth of uterus. Protection and trophic effect on both mother and embryo.	
		+	Irritation of mucosa, gastric and other; and nausea.	Counteracted by corpus luteum (?)
Fetus:	Related to placental glands.	+	Plays a rôle in developing function of mammary glands (?)	